SCIENCE AND OUR FUTURE

SCIENCE INSTITUTE OF THE NORTHWEST TERRITORIES ANNUAL REPORT 1986-87

Phrases in seven languages occur in this report.
Here are their English translations.

Page 12, Inuktitut
The best way to learn about the North, to understand the problems and priorities of its people, is to live here.

Page 14, French
Scientific research is a tool for resolving problems and realizing opportunities.

Page 16, South Slavey
Native knowledge was the sole basis for human survival in the North until very recently.

Page 18, Chipewyan
Northern science needs northern-born scientists.

Page 20, North Slavey
Scientific reports often have to be "translated" into plain English.

Page 22, Dogrib
All scientists are now required to let local people know about their research plans.

Page 24, Loucheux
There is a wealth of knowledge in all northern countries that could be of enormous benefit.

Page 26, Inuvialuktun
Achieving these goals will require coordination and commitment.

SCIENCE
AND OUR FUTURE

SCIENCE INSTITUTE
OF THE
NORTHWEST TERRITORIES
ANNUAL REPORT 1986-87

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Cover photograph by Tessa MacIntosh
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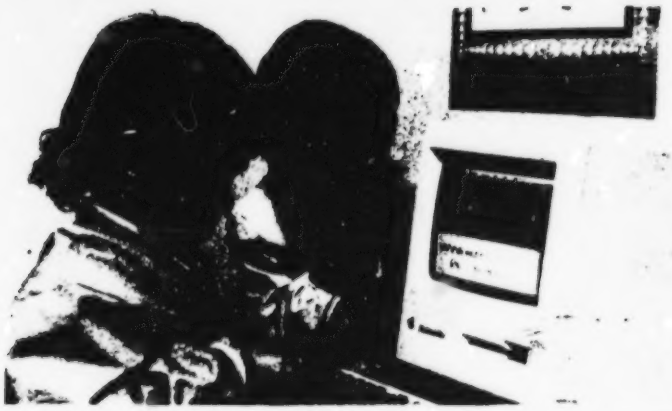
The boy is Paul Football of Snare Lake, NWT

Photographs on pages 5, 11, 12, 13 (top), 15, 16, 19, 23, 25 and 27 by Tessa Macintosh, Culture and Communications, GNWT; page 14 Bob Wilson, Culture and Communications, GNWT; page 17 Tessa Macintosh, Native Communications Society; page 21 Bruce Sekulich, Culture and Communications, GNWT

CONTENTS

Understanding the World Around Us 5
Introducing the Science Institute 7
A Resident Scientific Capability 12
Northern Research Funding 14
Recognizing Traditional Knowledge 16
The Next Generation of Researchers 18
Information and Awareness 20
Sound and Humane Advice 22
A National and International Perspective 24
Emerging Concerns 26
Summary of Activities, 1986-87 28
Auditors' Report 31



Science is . . . the knowledge and understanding of the world around us obtained through careful observation, study and asking questions.

Science has as many names as it has subjects, from anthropology and chemistry to virology and zoology. It can deal with any aspect of nature that people are able to experience or observe:

the physical world (land, air, water, ice and the like)

the living world (animals, plants, and human health)

the social world (cultures, economies and communities).

These different orientations give rise to different categories of research, including physical, life, and human, or social, sciences.

Science also takes different forms in different cultures. The numerical, specialized studies of mainstream science represent one method of understanding the world. The hands-on observation of living systems that has been practiced for centuries by native northerners represents another. We can, and must, learn and benefit from both.

Top: Stephen and Dale Puskas of Yellowknife

Above: Marie Quitte, Rae Lakes

Kirt Ejesiak at GREC in Iqaluit

The best way to ensure that northerners benefit from science is to ensure that they participate.

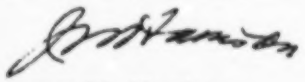
The Science Institute of the Northwest Territories is a new organization with large responsibilities. It was created by the Legislative Assembly of the NWT in 1984, as an independent, non-profit agency. Its task is to ensure that the people of the Territories obtain the maximum possible benefit from science and technology.

How is this to be done? How can we foster scientific activities that will make life safer, or more equitable, or more enjoyable, for the people of the Northwest Territories? How can we minimize the harm caused by misdirected research or technology? The truth is that we do not have definitive answers to these questions; and there is no shame in this admission. Around the world, people are posing similar questions and facing a similar lack of simple answers. Finding solutions to these problems is one of the pressing challenges of our time.

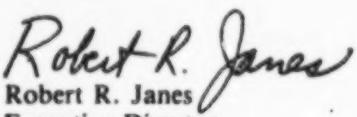
As part of this worldwide search for solutions, the Science Institute has developed the program of action outlined in this report. We offer it for your consideration. In general, we believe the best way to ensure that northerners benefit from science is to ensure that they participate in it. The answers we are seeking can only emerge from a process of continuing interaction between the scientific community and the general public. This applies to the formation of the Institute's policies and programs, just as it does to research.

This is an ideal time for you and other interested people to have an impact on the work of the Institute, because the organization is still young. Over the next few years, we will be setting the pattern for the future. The last fiscal year, April 1986 to March 1987, was a succession of beginnings. Almost everything had to be worked out, from the design of our offices to the details of our financial arrangements. All four members of the staff joined the Institute within a few months of each other, three in newly created positions. Every day brought its quota of unprecedented decisions, ranging from the mundane — "What kind of purchasing procedures does the Institute require?" — to the far-reaching — "How can the Northwest Territories influence the nature of a national policy on science and technology?" We expect the next several years to be equally dynamic.

If you wish to comment on any aspect of the Institute's activities, past or in prospect, please contact us or any other member of the staff or board. The problems we face are urgent and complex, and can best be addressed through broad discussion. We would appreciate the benefit of your ideas and insight.



James M. Harrison
Chairman



Robert R. Janes
Executive Director

Board of Directors

The Science Institute is an independent agency with a special relationship to the Legislative Assembly of the Northwest Territories. By law, the Institute reports to the Assembly through a designated Minister, the Honourable Red Pedersen. Our board members are nominated by the Institute but receive their official appointments from the Executive Council. We also receive core funding and various administrative services from the Territorial government.

Within this framework of official support, the Institute is established by law as a free-standing, non-profit organization that operates under the direction of a public board of directors. This board includes representatives from the general public and the scientific community in approximately equal numbers.

In 1986-87, the board held three meetings, two in Yellowknife and one in Fort Good Hope. To encourage public participation at the Good Hope meeting, we enlisted the help of the GNWT Language Bureau, local radio stations and interested residents, to acquaint the community beforehand with the work of the Institute. It is worth noting that the broad definition of science that we use arose from the challenge of explaining our mandate in the North Slavey language. Local attendance at the meeting was excellent, and we intend to continue the practice of holding at least one board meeting per year away from Yellowknife, to provide opportunities for public comment.

The board is chaired by **Dr. James M. Harrison** of Ottawa who, prior to the creation of the Science Institute, served as chairman of the NWT Science Advisory Board. Dr. Harrison also heads the Institute's fund-raising committee, one of three board committees that were established in the past year. A veteran Canadian geologist, Dr. Harrison was also a founding member of the Science Council of Canada and currently serves as president of the Canadian Commission for UNESCO.

Ann Hanson of Iqaluit brings to the Institute many years experience in community service and native-language broadcasting. She is vice-chairman of the Institute's board and also heads the board's priorities and planning committee.

Above: The Science Institute Board of Governors stopped in Norman Wells last fall on the way to their meeting in Fort Good Hope. Back row, left to right, Dr. Ross Mackay, Dr. Otto Schaefer, Eli Panipakoocho, Robert Janes (staff), Dr. James Harrison, Dr. Ernie Pallister, Dr. Milton Freeman. Front row, Jane Dragon, Ann Hanson, Laurie Nowakowski (staff). Missing: Sally Karetak, Dr. Max House and Elizabeth Crawford.

The Institute's membership and compensation committee is chaired by well-known northern scientist **Dr. Ross Mackay**. Dr. Mackay, who was recently awarded an honorary Doctor of Science degree by the University of British Columbia, has spent more than thirty field seasons in the western Arctic, carrying out basic research on permafrost and other cold-climate phenomena.

Elizabeth Crawford of Inuvik was born and raised in Fort McPherson and educated in Aklavik, Prince Albert and at the University of Saskatchewan. A teacher of twenty years' standing, she has also served on the board of the Dene Cultural Institute and a number of community organizations.

Jane Dragon of Fort Smith has been involved in the work of the Science Institute and its predecessor, the Science Advisory Board, since 1981. A teacher, craftsperson, sports woman and community worker, she was awarded the Queen's Medal in 1979, in recognition of her valuable contribution to the quality of life in Fort Smith.

Dr. Milton Freeman, an anthropologist at the University of Alberta in Edmonton, was first appointed to the Science Advisory Board in 1982. He has lived in the eastern arctic and travelled extensively in the North over the past thirty years. At various times he has served as adviser on environmental and social affairs to local, territorial and federal governments and to national Inuit organizations.

Dr. Max House is a Professor of Medicine and director of the Telemedicine Centre and the Centre for Offshore and Remote Medicine at Memorial University of Newfoundland. He has been honored for his work in distance education and "telemedicine" — the use of electronic communications media to provide health services in remote communities.

Sally Karetak of Rankin Inlet is in training as the Museum Development Officer for Inuit Silattuqsarvingat. Now in her early twenties, Sally joined the board "to show my interest as a native and as a youth." She holds a high school diploma, with specialized training in business, and has worked as a secretary, tour guide and interpreter.

Dr. A.E. (Ernie) Pallister continues to receive recognition for his contributions to the Canadian oil industry. The founding Chairman of C-CORE (Centre for Cold Ocean Resources Engineering), he currently heads the boards of C-FER (Center for Frontier Engineering Research) at the University of Alberta and the Arctic Institute of North America at the University of Calgary. He serves on the Science Institute board with "the strong conviction that the Institute can serve as a means of focusing much of the northern research done in southern Canada to the needs of residents of the NWT."

Eli Panipakoocho was formerly a science administrator with the Arctic Research Establishment in his home community of Pond Inlet. He is currently employed as a Land Use Planning Field Workers' Coordinator for the Lancaster Sound region.

Dr. Otto Schaefer is an internationally respected expert on northern health care. A recipient of the Commissioner's Award, Order of Canada, Northern Science Award, and many other honors, he brings more than thirty years of experience in northern medical research to deliberations of the Institute.

During the current year (1987-88), Mrs. Dragon and Dr. Freeman will complete their terms on the board, while Joanne Barnaby, Executive Director of the Dene Cultural Institute, will join us. Ms. Barnaby was national coordinator of the Comprehensive Claims Coalition which persuaded the federal government to change its land claims policy. She has also served as a research director for the Dene/Metis Negotiations Secretariat and as director of the Dene Nation's Land and Resource Department.

Board committees 1986-87

Fund-raising committee

James Harrison, chairman
Otto Schaefer
Max House
Robert Janes, ex-officio

Priorities and planning committee

Ann Hanson, chairman
Elizabeth Crawford
Milton Freeman
Sally Karetak
Ernie Pallister
Robert Janes, ex-officio

Membership and compensation committee

Ross Mackay, chairman
Jane Dragon
Eli Panipakoocho

Staff

The Science Institute has four full-time staff positions, which are supported through core funding provided by the Government of the Northwest Territories.

Robert Janes, the Institute's first executive director, is a northern archaeologist/anthropologist and was founding director of the Prince of Wales Northern Heritage Centre in Yellowknife. He continues his ethnoarchaeological research among the Dene of the Mackenzie Valley and has contributed to several professional journals and conferences over the past year. In addition to his responsibility for the work of the Science Institute, Dr. Janes also serves as science advisor to the Government of the Northwest Territories (more on page 22).

Lynne Green, our executive secretary, was born and raised in England and has lived in Yellowknife for four years. She has more than twenty years' experience as an executive secretary/personal assistant in financial institutions, business and government. As the Institute's first executive secretary, she designs office systems and procedures, as well as providing support services for other staff members.

Laurie Nowakowski, the first person to hold the post of science administrator, has lived in the NWT for the past twelve years. Trained as a Medical Laboratory Technologist, she has worked in health care, as well as in environmental monitoring programs. Prior to coming to the Science Institute, she was in charge of the Territories' Occupational Health and Safety Program for five years. At present, she oversees the Institute's finances and the student field program (see page 18) and also administers the Scientific Research Licences (page 23).

Candace Savage, who occupies another newly created position at the Institute, joined the staff in March as the Coordinator of Information/Education. She has worked as a writer, editor and publishing consultant and is the author of several books based on scientific research reports. Before joining the Science Institute, she was employed as an information officer for the Government of the NWT. Her new book on the eagles of North America will be published in the fall of 1987.

Above: left to right, Laurie Nowakowski, Science Administrator; Dr. Robert Janes, Executive Director; Candace Savage, Information and Education; Lynne Green, Executive Secretary.

A RESIDENT SCIENTIFIC CAPABILITY

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"Live-in Science" — a strong scientific community that lives and works in the Northwest Territories — is a major goal of the Science Institute.

At present, most northern research is still conducted by people from southern-based universities, corporations and government departments. Some of these people come back year after year and know the Territories well. Many have made important contributions to the well-being of northern residents.

Inside the Iqaluit Scientific Resource Center. Under the Science Institute, the three Centers would expand their services to people in the local community and region.

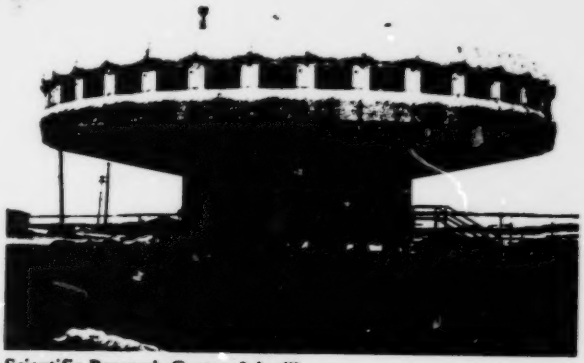
But most people, including many researchers, would agree that this "fly-in science" is not ideal. If researchers live in southern Canada and work for southern-based institutions, they may be inclined to investigate problems that are of interest from a southern point of view. If they live in the Territories, they are more likely to become involved in the solution of problems that are experienced by northern people. After all, the best way to learn about the North — to understand the problems and priorities of its people — is to live here. This is as true for scientists as for anyone else. We are not proposing an end to southern-based research. Rather we want to augment it with a northern perspective.

The idea that more northern science should be carried out by researchers who live in the Territories is not new. People have been talking about it for years. But what can be done? As with most complex problems, there are no simple, one-step solutions. Still, progress is possible on a number of fronts, including access to specialized training, research funding and scientific facilities. In the last year, we have undertaken several initiatives that hold promise.

Several of these are discussed later in this report (see pages 14-15 and 18-19). In this section, we'd like to tell you about attempts to obtain research facilities for use by scientists, and other people, who live in the NWT.

Scientific Resource Centers. There are three Scientific Resource Centers in the Northwest Territories, located in Inuvik, Igloolik and Iqaluit, which maintain laboratories, libraries and other facilities for scientific research. At present, these centers are operated by Indian and Northern Affairs Canada and, for the most part, serve southern-based students and scientists.

The Science Institute believes that these centers should also be lending support to the development of northern, community-based research, by providing training and other scientific services for northern residents. With this in mind, negotiations were begun in 1986-87 to transfer the Resource Centers, together with the necessary staff and funding for their operation, to the Science Institute. These discussions are proceeding well and if progress continues, the transfer could occur by April 1, 1988. At present, the Institute has begun planning for the takeover, to ensure that northern residents will receive the fullest possible benefit from these facilities when they become part of the Institute. Our projected program for the Resource Centers includes establishing local advisory groups; improving services to local and regional residents through training, employment, lectures, demonstrations and so on; increasing interaction with Arctic College through sharing of facilities and staff; starting a winter fellowship program that would permit scientists and scholars to spend a full year in the Territories; and focusing attention on research projects that address the needs or concerns of people in the NWT.



Scientific Research Center, Igloolik

Top: Maurice McRae, Senior Technician at the cosmic ray monitor in the Inuvik Scientific Resource Center

La recherche scientifique est un outil qui permet de résoudre des problèmes et de réaliser des possibilités.

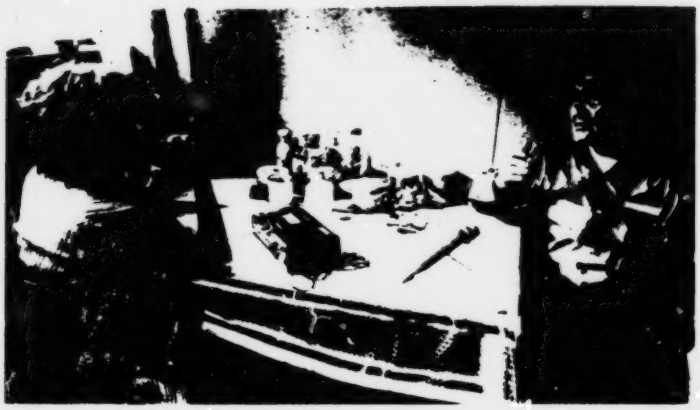
Research costs money. In the past, most funding for northern research has been administered by agencies based in southern Canada. This was natural enough, given that universities, trained personnel and research facilities were (and are) concentrated there. In many ways, this arrangement has worked well, and a great deal of valuable scientific research has been achieved. The Science Institute would like to see this work continued and enhanced. But at the same time we believe there is a need for research funds administered in the North.

Does it really matter where decisions about scientific funding are made? We think it does. Under the existing rules, research money has been most easily available to people associated with governments and universities. As a result, decisions about research — what to investigate, how to design studies, who to hire as researchers and assistants — were generally made by southern-based experts. Not infrequently, northern people have felt resentful or confused about their involvement in projects directed by "outsiders". They have often wondered, sometimes with justification, if their interests were being served.

Research needs the skills and ingenuity of northern people.

In the right hands, scientific research is a tool for resolving problems and realizing opportunities. Residents of the NWT deserve an opportunity to advance their own interests, in their own terms, by helping to decide which studies are needed and how they ought to be carried out. They cannot do this without money. A research fund administered from a northern perspective could be a vehicle for enhancing the decision-making power of individuals, communities and groups in the Territories.

Community-based research. Ideally, the Science Institute would like to establish a research fund for the NWT, to support "community-based" research and other studies of special importance to the North. Community-based research refers to projects in which university-trained experts and local residents collaborate as equal partners in the design and execution of scientific work. One recent example of this approach is the *Dene Gondie* study, which was undertaken by the Dene Nation in conjunction with Dr. William Rees of the School of Community and Regional Planning at the University of British Columbia. Designed to assess the socio-economic impacts



of the Norman Wells pipeline, the project was developed collectively, and much of the research was executed by community residents who were specially trained in scientific data collection and analysis. At the same time, northern field experience was provided for several southern-born graduate students. Everyone benefitted, and a high standard of scientific work was achieved.

By supporting well-conceived studies of this sort, we can ensure that northern priorities are reflected in research. As Lynda Lange's "Report from the Native Groups of the Northwest Territories on their Situation with Research" fully bears out, northerners are now calling for a chance to direct their own research. Dr. Lange's report, which was sponsored by the Science Institute and the Association of Canadian Universities for Northern Studies, includes information on the research needs of twenty northern organizations, as defined by themselves during 1986-87.

If the residents of the NWT had access to research funding, we suspect that the overall orientation of northern science would shift. Would the number of "human science" projects (archaeology, economics, political science, sociology, and so on) begin to increase, rather than continue to decline as seems now to be the case? Would we see more research directed to the application of science and technology in the interests of sustainable economic growth? We think both these improvements would be achieved.

In 1986-87, the Science Institute took the first steps towards its goal of a northern research fund, by achieving tax-free status as a non-profit organization. This put the Institute in a position to accept gifts of money. Then, with the unanimous support of the board of directors, the chairman and executive director made a national fund-raising tour, paying initial visits to fourteen potential donors. In addition, discussions were begun with territorial and federal officials towards the provision of funding for technological research and development, as part of the Economic Development Agreement.

The Institute also obtained membership on two committees which allocate funding for northern research. The Environmental Studies Revolving Fund supports environmental and social studies related to oil and gas development, while the Northern Studies Training Program (NSTP) last year distributed $748,000 to Canadian universities to support research projects by advanced students. The purpose of the NSTP is to provide northern experience for students and encourage them to develop a commitment to northern science.

The Institute also received a grant of $25,000 through the Honourable Bill McKnight, Minister of Indian and Northern Affairs Canada, toward the continued operation of our summer field program (more on page 18). In addition, the Government of the NWT, taking into account the difficult fiscal circumstances of this decade, agreed to provide a matching grant of 50 cents for every dollar raised, up to a maximum of $150,000 per year. We are grateful for this initial support and hope to build on it in the coming years.

Above: Northern people can, and are, conducting research. The Science Institute wants this participation to continue and expand.

Dúhthale gots'ę́, ekúhdę Góhdlı Ndéé, Dene kéleh dáóndíh mek'eh gots'endíh kegogedıhshǫ zǫh, megháádé agaot'į.

Johnny Neyelle of Fort Franklin is shown here drying snowshoes so they will hold their shape. Native technology and knowledge are a rich resource for science in the Northwest Territories.

Science has no monopoly on truth. We all recognize the achievements of the western scientific tradition. Science and technology condition our thoughts; our hopes; the intimate, practical details of daily life — what we eat and wear, how we shelter ourselves and communicate. But for all its power and importance, mainstream science is not the only effective system for acquiring and organizing knowledge.

Northern native peoples have their own sciences, a wealth of information and understanding based on acute observation of the world around them. Transmitted from generation to generation, this traditional knowledge incorporates many thousand years of northern experience. Although its underlying assumptions and purposes are often different from those of mainstream science, traditional knowledge is no less rigorous or empirical. After all, native knowledge of the land, seasons, plants, animals, birds, human nature and natural interrelationships was the sole basis for human survival in the North until very recently.

The importance of cooperation and sharing between holders of traditional and scientific knowledge cannot be overstated. Each has much to learn from the other. But it is also fair to stress that this collaboration does not always happen easily. Attitudes of mistrust or arrogance on either side can prevent sharing. So can the very practical problems of "translating" between an oral, personalized system of knowledge (traditional knowledge) and a written, depersonalized one (the scientific system).

Objectives and action. Overcoming these obstacles to collaboration is an objective of the Science Institute. Our long-term goal is to develop and support research that incorporates local knowledge and mainstream science and focuses on problems of concern to both groups. We believe that this can be achieved, in part, through encouraging community-based research. If local people participate fully in planning and conducting research, their knowledge must necessarily be taken into account. We also see a need to make scientists more aware of this opportunity and to acquaint them with appropriate research methodologies.

In 1986-87, Institute's commitment to greater sharing between traditional and scientific knowledge was manifested in a variety of ways. We were present, as observers, at a conference on integrating tradition, technology and science, which was sponsored by the Boreal Institute for Northern Studies in Edmonton. Our executive director served as an advisor to the board of the Inuit Cultural Institute, as they developed Inuit Silattuqsarvingat, a learning center based on traditional knowledge. He also spent ten days assisting at the Drum Lake Ethnoarchaeological Field School, where traditional knowledge provided by Dene elders is coupled with training in archaeological field techniques. Five young Dene received a hands-on introduction to ethnoarchaeology, by helping to excavate a hundred-year-old Mountain Dene winter house.

The Institute also hosted a series of informal meetings involving representatives of several organizations with an interest in the recognition and use of traditional knowledge. Recommendations for action are beginning to emerge from these discussions. Anticipated projects for the next year include designing and implementing a research project which demonstrates the usefulness of collaboration, and organizing a workshop for renewable resources specialists to highlight the value of traditional and local knowledge in biological research.

Above: "Rat root," a traditional medicine, in the hand of a Dene elder

Ją nuwe nëné ts'ı ʔasí k'áaneta dé nuwe nëń ts'ı dëne honełtën dëné dınáaltı.

Science and youth are a natural combination. Children love asking questions and trying things out. "Why?" "How?" "I wonder what would happen if. . ." This kind of zestful curiosity is the basis of science. With the right kind of guidance, it can develop into a lifelong enjoyment of scientific pursuits. For those with exceptional interest and talent, it can lead to higher education and a scientific career.

At present, there are very few northern-born scientists. We think it is time that this changed. For one thing, there are many interesting employment opportunities in the NWT for people with scientific and technical training. These span the entire range of sciences, from archaeology, political science and psychology to biology, medicine and engineering. The people who hold these positions conduct research and make decisions that affect the future of northern communities. Northern-born people should be in a position to take advantage of these opportunities and challenges.

What's more, northern science needs northern-born scientists. Growing up here brings a special kind of intimate knowledge, and a special loyalty. These qualifications are crucial to assuring that the priorities, knowledge and values of NWT residents are incorporated into research.

Realistically, we have to admit that the situation cannot be set right overnight. The training of a scientist is a long process. From school entry to professional standing, it can easily span twenty years. Along the way, there are inevitably many obstacles and setbacks. For children in northern settlements, there are apt to be extra difficulties, such as barriers of language, culture, distance, lack of role models and lack of opportunity. These disadvantages must be overcome, so that northern people can enjoy the full benefits of their own and their children's talents.

Science for fun and the future. In 1986-87, the Science Institute took a number of steps to provide scientific experience and training for interested northerners. Our major effort was the summer field program, which provided approximately $30,000 in subsidies for scientists to hire and train NWT residents as research assistants. Twelve young people from across the Territories took advantage of this opportunity to experience scientific work, including archaeology, anthropology and biology, at first hand (see insert).

In December 1986, the Institute entered into an agreement with the Northern Heritage Society (NHS) to work together on a similar but improved program for the 1987 field season. As one phase of this project, northerners who wished to work on summer research projects were invited to place their resumes on file with the NHS as part of their Arctic Science Assistant Program database. These names were then made available on request to scientists, as potential employees. In addition, the Science Institute obtained a grant of $25,000 from Indian and Northern Affairs Canada, to help sustain the program over the next two years. This collaborative program, a pilot project for both the Institute and the Northern Heritage Society, will be evaluated at the end of the 1987 field season.

Many scientists who come North to do their field work in the summer go home with samples or data for analysis in their laboratories. Northerners, especially those who work as research assistants, should have a chance to experience this aspect of science as well. In January 1987, the Science Institute provided funding to permit Elisha Pewatoalook of Pond Inlet to spend two weeks at the Fresh Water Institute of the Department of Fisheries and Oceans in Winnipeg. Here he was able to observe the analysis of data on narwhal vocalization which he had helped collect. This training proved valuable for both Mr. Pewatoalook and research scientist Michael Kingsley. When asked whether he would try such an exercise again, Dr. Kingsley replied with "a definite 'Yes' ". As funds permit, the Science Institute hopes to extend this opportunity to other research assistants.

In 1986-87, the Institute also had the privilege of contributing $7,000 to support four students at the Northern Heritage Research Project Arctic field school on Devon Island, where they received technical training in arctic ecology, environmental geography and archaeology. Those sponsored were Gilbert Nitsiza of Lac La Martre, King Kingwatsiak of Cape Dorset, Madeline d'Argencourt of Iqaluit and Sally Karetak of Eskimo Point. Ms. Karetak subsequently became a member of the Institute's board.

We see these activities as beginnings, which offer much opportunity for improvement and expansion. In the near future, we hope to move towards closer collaboration with Arctic College. We also intend to provide services for school-age children. With this in mind, we requested a grant from the Ministry of State for Science and Technology, through their Public Awareness Program, to encourage the development of science fairs in the Territories. We have just received word that our application has been approved.

Summer Field Program, 1986
The following NWT residents received training and experience in research, with the support of the Science Institute:

David Akeeagok, Grise Fiord
Edwin Bourque, Yellowknife
Taig Connell, Fort Smith
Lynn Cousins, Iqaluit
Jeannie Joseph, Arctic Bay
Moe Keenainak, Pangnirtung
Norm McLean, Yellowknife
Meeka Mike, Pangnirtung
Jimmie Oleekatalik, Spence Bay
Russell Padgham, Yellowknife
Larry Penner, Fort Smith
Jeff Smith, Yellowknife

Above: Any future anthropologists, geologists or medical researchers here?

T'áhsı gok'éárehta déné ke ʔedıhtl'é yákedítl'e k'áhjıne golǫ gots'ę́ xeedee déyí le k'ę́ rakıdétl'e gha got'ódéʔa.

Sharing of information is basic to the development of northern science. Northerners cannot have input into projects they are not aware of. They cannot comment on research they do not understand. Scientists can't progress fully in their work unless they are up-to-date on their colleagues' results.

One of the barriers that interfere with the sharing of scientific information is language. Scientific reports often have to be "translated" into plain English before they can be presented to an audience of nonspecialists. This involves more than finding words to explain technical terminology. It also means explaining the concepts and motivation behind the work. What is the researcher curious about? Why does he or she want to know? What is the significance of the research? Once this first step has been taken, we can go on to present the information in northern languages, using media (radio, television, newspapers) that reach people in the communities of the NWT. To date, very little of this time-consuming but essential work has been done. Northerners need this information, if they are to speak with confidence about scientific and technological developments that affect their lives.

Science in the news. In 1986-87, the Science Institute demonstrated a commitment to meeting this need by hiring its first Coordinator of Information and Education. Projects planned for the next year include providing understandable information about current research to the news media and community organizations; publicizing the Scientific Research Licence system, to ensure that everyone who is eligible is included in our information network; providing regular contributions to CBC radio; and exploring the possibility of a northern science television program. We are also compiling a listing of researchers who live in the North, in the hope of organizing a series of community talks. Our science-fair and summer student field programs will also contribute to improved public awareness and understanding of scientific activities.

The Institute also has a responsibility to facilitate communication among scientists. One way in which we've attempted to do this is by contributing all our 1986 licence listings to the Arctic Science and Technology Information System (ASTIS), maintained by the Arctic Institute of North America at the University of Calgary. ASTIS is a computerized listing of scientific and technical information about the North. In addition, the Institute is collecting research reports from the scientists it licences so that these documents will be available for reference.

We are currently beginning to investigate the question of "grey literature," research findings that are published only as in-house reports and never find their way into libraries or bibliographies. This information is not easily available to other researchers and consequently is of less use than it might be. Once we have estimated the extent of this problem, we will suggest ways of making improvements.

It may also be worth noting that, in 1986-87, the Institute reprinted its background study entitled "Investigation of the Viability of a Remote Wind/Hydroelectric Power Supply in the Northwest Territories," which had originally been issued a year earlier.

PUBLICATIONS

The following publications are available from the Science Institute, at $5.00 per copy.

Contribution to the Northwest Territories Population Studies, 1961-1985
by Professor Louis-Edmond Hamelin
54 pages

Aquatic Resources of the Northwest Territories
by Dr. Peter J. McCart and Mr. J. Den Beste
55 pages

The Present Status and Future Management of Arctic Marine Mammals in Canada
by Drs. Rolph A. Davis, Kerwin J. Finley and W. John Richardson
93 pages

Management of Some Terrestrial Mammals in the Northwest Territories for Sustained Yields
by Dawn M. Dickinson and Tom Herman
71 pages

Dietary Habits and Nutritional Base of Native Populations of the Northwest Territories
by Otto Schaefer and Jean Steckle
38 pages

Wind Energy in the Northwest Territories
by B. Janz, D.G. Howell and A. Serna
108 pages

Fish, Fur and Game in the Northwest Territories
40 pages

Fish, Fur and Game for the Future A Summary of Presentations and Discussions
28 pages

Metallic Contaminants of Significance to Northwest Territories Residents
by R.D.P. Eaton
35 pages

An Investigation of Possible Small Hydro Generating Sites in Northwest Territories Communities
by Ferguson, Simek, Clark
68 pages

An Acid Deposition Perspective for the Northwest Territories
by S.R. Shewchuk
32 pages

Above: Bernelda Wheeler of CBC's *Focus North*, interviews Dr. James Basinger, about his recent discovery of an ancient tropical forest in the High Arctic. The Science Institute arranged media interviews for Dr. Basinger and hopes to provide a similar service for other scientists in the NWT.

Scientists gų ų sı kǫta t'ala yagò la ası hagèta ha gıwǫ nındè gondı hǫt'ı nagehts'ı tł'ahǫ eyı edàgele dǫne ts'ǫ̀ hagedı ha.

In addition to its other responsibilities, the Science Institute acts as science advisor to the Government of the Northwest Territories. This involves us in a variety of tasks. Last year, for example, we were called upon to represent the Minister responsible for the Science Institute, the Honourable Red Pedersen, and the Government of the NWT in the development of a national policy on science and technology. In initiating this exercise, the federal government suggested that there were certain "strategic technologies" such as information processing, robotics and artificial intelligence which would be critical for the advancement of the Canadian economy. While this may be true for central Canada, it is an unlikely forecast for the Northwest Territories.

In our submissions, we stressed the importance of regional initiatives. Each jurisdiction must be able to define the research, development and technologies which are appropriate to them, and be able to count on the central government for assistance. We also recommended that Canada recognize and build on its existing expertise in cold-climate technology, as part of its development strategy.

These discussions culminated in the signing of a national policy in March, 1987. As part of a continuing process of definition and implementation, the Science Institute has agreed to serve on a national Working Group on the Impact of Science and Technology. This group is investigating ways of promoting public awareness and debate about the responsible use of science and technology.

Another upcoming task as science advisor is an investigation of the Slowpoke II nuclear reactor. The Legislative Assembly has requested a report on the social and economic suitability of this reactor for electrical-power generation in the NWT. The assessment will be based on the operation of a prototype reactor located at Pinawa, Manitoba, and the Science Institute will begin its research once there are sufficient operating data for assessment.

Scientific Research Licences. The Institute's major task as science advisor is the issuing of Scientific Research Licences. All researchers who study the NWT are required by law to obtain a licence from the Science Institute before they begin work. The only exceptions are archaeologists and wildlife biologists, who must apply to the Prince of Wales Northern Heritage Centre and the Department of Renewable Resources, respectively. In 1986-87, the Institute issued licences to 113 researchers.

As we see it, licencing serves two purposes. One is to provide an opportunity for contact between researchers and people who may be affected by their work. As of last year, all scientists who planned to work in or near a northern community were required to let local people know about their research plans and obtain the consent of the community council. Licencing also serves as a means of gathering information so it can be shared. Last year as well, researchers were for the first time asked to provide short plain-language summaries of their work, suitable for translation into native languages. The work of preparing publications and broadcasts based on this material will continue through the current year. We also plan to produce a new information package for researchers, to facilitate their contact with communities, explain the purposes of licencing and ensure that everyone contributes their findings to this information network.

Groups like the Spence Bay hamlet council, shown above, now have an opportunity to comment on research projects before they are licenced.

Nakhwonanh gwıınıık'oo gwızhıt łı? hah ınıhłık gwa?an ıjuch'ıı leu eenjıt gahgwıdındaıı, aıı t'at gwıt'ajahnch'uu gwık'ıt goodlıı.

The arctic is one world, and arctic science is one enterprise. Yet, at present, there is little co-ordination amongst the agencies involved. In Canada alone, there are literally dozens of organizations and institutes involved in northern research. These include at least seven governments, thirty-five universities, and numerous associations and businesses. Generally speaking, there has been little formal collaboration amongst these groups. In those instances where cooperation has been achieved, it has been a result of individual personalities, rather than organizational commitments. This fragmentation comes at a high cost, both intellectual and financial, which northern science can no longer afford.

The Science Institute has responded to this challenge by establishing informal communication with a long list of organizations, both southern and northern-based. In addition, we have formal links with the Arctic Institute of North America and the Churchill Northern Studies Centre, through membership on their boards. In 1986-87, the Institute hosted meetings for both the Arctic Institute and the Association of Canadian Universities for Northern Studies, and attended a meeting of the Canadian Climate Program. We also participated in the Northern and Offshore Information Resources seminar that was held in Yellowknife in April, 1986. Our collaboration with the Northern Heritage Society is dealt with elsewhere in this report (page 18).

The value of a coordinated approach was demonstrated by our action to ensure northern input into planning of the proposed Polar-8 icebreaker. We were concerned that this multi-million dollar vessel, which is intended to serve as a floating laboratory, would be planned by the federal government without significant northern involvement. Accordingly, we wrote the federal government to inform them of our interest and simultaneously contacted fifty other northern science agencies and governments about the need for them to become involved. We have now been assured that northern groups will be consulted about the research agenda of the vessel. This is an issue we will follow closely over the next year.

Canada and Polar Science. Another matter that will require continued attention from the Institute, and other northern-science agencies, is the recent proposal to found a Canadian Polar Research Commission. If formed, the Commission would consist of up to a dozen people with a strong commitment to the development of northern science and would report to the federal government at a very senior level. The idea of the Commission, which is now being considered by the Minister of Indian and Northern Affairs, emerged from the year-long deliberations of a federally sponsored working group on "Canada and Polar Science". The Science Institute contributed to these discussions with a brief that stressed the simultaneous needs for coordination and for meaningful support of existing organizations. Our brief also took a stand against any "centralized, monolithic, southern-based approach to polar affairs". We will continue to support the formation of the Commission and to insist that it have a strong presence in the North. We will also take the initiative to coordinate responses to the proposal, so that northern-research organizations can speak with a clear voice on this important issue.

Internationally, there is also a need for improved communication. While exchanges have occurred, they have done so on a small scale and seemingly with difficulty. Yet there is a wealth of expertise and knowledge in all northern countries that could be of enormous benefit to residents, scientists and policy makers throughout the circumpolar world. In 1986-87, the Science Institute took the opportunity to participate in the USSR/Canada Arctic Science Exchange and also held meetings with researchers from northern Norway and the People's Republic of China. We expect our involvement in such exchanges to continue and enlarge over the next several years.

Throughout the circumpolar world, people are facing similar social and technological challenges. We must work together, across provincial and national boundaries. Pictured above: Methusalah Kunuk of Iqaluit who is both a hunter and a senior municipal affairs officer with the Government of the NWT.

Ikayutinik aghurniglu aturiaqaqtuq tikinniarupta piyumayaptingnut.

New challenges and priorities continue to emerge through our involvement with northern science and northern communities. Here are three issues that became a focus of attention in the last year and will require continuing work.

Environmental Monitoring. The Arctic is becoming a repository for some of the world's most toxic pollutants. Yet the NWT currently lacks a systematic, long-term ability to monitor the effects of environmental contaminants. Instead, our regulatory agencies often respond only after a crisis has developed and then react one by one, each working within its own specific mandate to protect animals, fish, forests or human health.

The need for better funding and more co-ordination in this area was highlighted in 1986-87 by the Institute's involvement with the Rayrock Advisory Committee. This body consists of scientists, managers and citizens, including people from Rae, the community closest to the abandoned Rayrock mine. As chair and secretariat for the committee, the Institute took a lead role in ensuring the cleanup of the site and in designing and implementing a long-term program for monitoring the quality of water and fish. The Institute will continue to serve on the committee and will broaden its involvement by pressing for improved intra- and inter-governmental cooperation on environmental monitoring.

Neglect of Human Science. The human sciences — archaeology, anthropology, economics, political science, psychology, sociology, and the like — are tools for monitoring the effects of technological and social change. Given the degree of change in the NWT in recent decades, human sciences ought to be in the forefront, alongside physical and life sciences. Yet it appears that the human sciences are receiving comparatively little attention. During the ten years from 1974-84, more than $55,000,000 was spent by federal agencies on physical, biological and ecological research in northern Canada. By contrast, about $200,000 was spent investigating social and economic development. Over the five years since 1982, only about 25% of the funding administered by the Northern Studies Training Program has gone to the human sciences; and the Social Science and Humanities Research Council estimates that 1% of last year's applications for research grants were for human science in the North.

In 1986-87, the Science Institute raised this issue with the Social Sciences and Humanities Research Council, the Northern Studies Training Program committee and the Association of Canadian Universities for Northern Studies. We intend to develop a discussion paper, with recommendations, for circulation among appropriate northern organizations. The goal will be to develop a plan of action to present to those who fund or support human science research in the NWT.

Sustainable Economic Development. People in the NWT need jobs in their home communities — jobs that can be depended on as a long-term source of income. Some of these opportunities can be achieved through new technology or "technology transfer", the adaptation of existing processes to local conditions. But these developments will not take place spontaneously. The NWT needs a plan to guide technological research and development (R&D), together with a program to provide funding to support small-scale, community-based innovation. Achieving these goals will require the commitment of several territorial and federal departments. As an initial step, the Science Institute will approach the federal and territorial governments to provide R&D money through a subsidiary Economic Development Agreement on Science and Technology.

Above: Building an exciting, livable future for people in the NWT calls for a full range of sciences — including human sciences. Here youngsters get a chance to appreciate an aspect of Inuit culture, with the help of Sally Karetak, a museum development officer and Science Institute board member.

March, 1986
Robert Janes hired as Executive Director of the Science Institute of the NWT (SINT), following the retirement of Dan Billings

SINT contributed a brief concerning the establishment of a National Polar Institute

April
1986-87 fiscal year began

Planning and design of new offices began

Robert Janes appointed Science Advisor to the Government of the NWT

Northern and Offshore Information Resources seminar, held in Yellowknife, with the participation of SINT

SINT hosted meetings of the Association of Canadian Universities for Northern Studies, in Yellowknife

SINT chaired a workshop of the Rayrock Advisory Committee in Yellowknife to address community concerns regarding health and safety

May
SINT attained representation on the Environmental Studies Revolving Fund

SINT Executive Director attended board meetings of the Arctic Institute of North America, as vice-chairman — explored possibilities for collaboration

SINT Executive Director attended meetings of the Inuit Cultural Institute in Eskimo Point, as advisor on the development of their traditional knowledge project, Inuit Silattuqsarvingat

SINT moved to new offices in the Scotia Centre

June
SINT board meeting held in Yellowknife, to develop three year plan

SINT Executive Director represented the Government of the NWT at a forum on a National Science and Technology policy, held in Winnipeg

Through the summer, SINT organized and funded a field training program that employed twelve young northerners as research assistants on scientific projects

SINT Executive Director attended a board meeting of the Center for Frontier Engineering Research, as a guest

SINT prepared an interim report for the Legislative Assembly on the Slowpoke II reactor

SINT Chairman attended a meeting of the board of the Churchill Northern Studies Centre

July
SINT provided funding for four young people to attend the Northern Heritage Research Project Arctic field school

SINT provided the services of the Executive Director to assist with the Drum Lake Ethno-archaeological Field School

SINT Executive Director held meetings in Fort Good Hope to plan for fall board meeting there

Laurie Nowakowski hired to fill the newly created position of Science Administrator

August
SINT achieved tax-exempt status as a charitable organization, an essential step for raising funds

Lynne Green hired to fill the newly created position of Executive Secretary

September
A plan of action for the transfer of the Scientific Resource Centers to the Science Institute was signed

SINT chaired meeting of the Rayrock Advisory Committee to plan for final cleanup of mine site; decision taken that the Committee should not disband once cleanup was complete

SINT began requiring that researchers obtain community approval before licencing; researchers were also asked to provide plain-language summaries of their research plans and results, for use in public information programming

SINT hosted the Arctic Institute of North America board meeting, in Yellowknife; first such meeting held in the North

SINT board meeting in Fort Good Hope was well attended by the public; half the meeting time was opened to local residents, so their interests and concerns could be heard

Three new board committees were created, to deal with fund raising, membership and compensation, and priorities and planning; three-year plan for SINT was approved

Ann Hanson appointed as vice-chairman of the board

October
Executive Director attended another meeting in Eskimo Point, to discuss Inuit Silattuqsarvingat

SINT added its 1985 and 1986 licencing data to the Arctic Science and Technology Information Service, maintained by the Arctic Institute at the University of Calgary

November
SINT Executive Director and chairman undertook a cross-Canada tour of potential funding sources

SINT Executive Director contributed a discussion paper at a national forum leading to the signing of a science and technology policy

SINT Science Administrator attended a conference sponsored by the Boreal Institute in Edmonton on integrating tradition, technology and science

The Government of the NWT agreed to grant 50 cents for every dollar SINT raises

December
SINT entered into an agreement with the Northern Heritage Society to collaborate on the 1987 summer field training program

SINT Executive Director traveled to a meeting on the National Science and Technology Policy and was appointed to a working group on the social and cultural impact of science and technology

SINT Executive Director attended a meeting on the quality of water and fish in the Mackenzie River

January, 1987

SINT provided travel funds and a stipend for Elisha Pewatoalook from Pond Inlet to study laboratory analysis of data he had helped to collect

SINT Executive Director attended an Arctic Institute Board meeting in Vancouver, as Vice-Chairman

February

SINT signed an administrative agreement with the Government of the Northwest Territories, covering the provision of support services as an in-kind contribution to the Institute

SINT took over control of its own finances from the Government of the NWT

Indian and Northern Affairs Canada granted SINT $25,000 to sustain the summer field training program

SINT board meeting was held in Yellowknife to consider the transfer of the Northern Scientific Resource Centers

SINT was appointed to the Northern Studies Training Program committee and assisted with the awarding of $748,000 in research grants; first NWT resident to be so involved

March

The Rayrock Advisory Committee, with SINT as chair, let a tender for the cleanup of the abandoned mine site

SINT initiated a national lobby to win northern participation in the planning of the Polar-8 ice breaker

SINT established an informal working group to seek ways of encouraging the collaboration between traditional and scientific knowledge

Candace Savage was hired in the newly created position of Coordinator of Information/ Education

SINT submitted an application to the Public Awareness Program for Science and Technology, for funding to stimulate the development of science fairs in the NWT

SINT Executive Director represented the Government of the NWT at the signing of the National Science and Technology Policy in Vancouver

SINT Executive Director participated in a Science Council of Canada meeting on science and technology in Canadian museums

To the Board of Governors
Science Institute of the Northwest Territories

We have examined the balance sheet of the Science Institute of the Northwest Territories and the statement of revenue, expenditures and surplus for the year ended March 31, 1987. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of the Institute as at March 31, 1987 and the results of its operations for the year then ended in accordance with the accounting principles disclosed in Note 1.

MacKay & Partners

Yellowknife, Northwest Territories
June 29, 1987

MacKay & Partners
Chartered Accountants

Statement of Revenue, Expenditures and Surplus
for the Year Ended March 31, 1987

	1987	1986 (Note 2)
REVENUE		
Government of the Northwest Territories	$393,300	$312,816
Eastern Arctic Seaboard Monitoring Program:		
Canada Employment and Immigration Commission	32,061	128,117
Indian and Northern Affairs Canada	25,000	-o-
Rayrock Program:		
Indian and Northern Affairs Canada	11,592	21,632
Northern Native Research Priorities Program		
Association of Canadian Universities for Northern Studies	-o-	12,500
Interest income	2,781	-o-
Sale of publications	-o-	161
	464,734	475,226
EXPENDITURES		
Management services (Note 1)	202,859	134,543
Travel	60,626	73,347
Honoraria	19,480	14,965
Office, postage and telephone	12,775	8,253
Consulting fees	12,106	80,655
Contribution to Canadian Wildlife Service	8,000	-o-
Contribution to Northern Heritage Society	7,000	-o-
Audit and accounting	5,000	-o-
Public relations	2,650	1,000
Library and printing costs	2,547	59
Eastern Arctic Seaboard Monitoring Program	57,061	128,117
Rayrock Program	11,592	21,632
Northern Native Research Priorities Program	-o-	12,500
	401,696	475,071
EXCESS REVENUE (EXPENDITURES)	63,038	155
SURPLUS, OPENING	155	-o-
SURPLUS, CLOSING	$ 63,193	$ 155

Balance Sheet
as at March 31, 1987

ASSETS

	1987	1986
CURRENT		
Cash	$ 28,756	$89,815
Term deposits	52,560	-o-
Accounts receivable	53,508	9,207
Prepaid expenses	102	-o-
	134,926	99,022
FIXED (Note 1)	33,789	-o-
	$168,715	$99,022

LIABILITIES

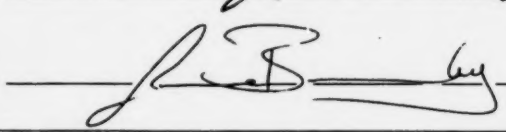
CURRENT		
Accounts payable and accrued liabilities	$ 12,027	$94,208
Deferred revenue (Note 3)	59,706	4,659
	71,733	98,867

INSTITUTE'S EQUITY

INVESTMENT IN FIXED ASSETS (Note 1)	33,789	-o-
SURPLUS	63,193	155
	96,982	155
	$168,715	$99,022

APPROVED BY THE BOARD OF GOVERNORS:

_____ Chairman



_____ Governor

Notes to the Financial Statements
for the Year Ended March 31, 1987

1. SIGNIFICANT ACCOUNTING POLICIES

A. Unrecorded Costs Paid by the Government of the Northwest Territories.
The Government of the Northwest Territories provides approximately 1,850 square feet of office space, rent free. In addition the Government provides telephone and mail services, printing, translation and library services, as well as other services that are under an Administration Agreement without charge. No provision has been made for these costs.

B. Management Services
The Government of the Northwest Territories provides the services of 4 employees (2 - 1986) at cost under a cost recovery contract.

C. Fixed Assets
Office equipment and furnishings belonging to the Government that were being used by the Institute were transferred to the Institute by the Administration Agreement on February 18, 1987 and recorded at values established by the Government.

Other fixed assets purchased by the Institute are expensed in the year of acquisition. The investment in fixed assets reflects the historical cost of all assets owned by the Science Institute which are capitalized on the balance sheet. Accordingly, depreciation is not taken on fixed assets and the investment in fixed assets is reduced for disposals.

2. COMPARATIVE FIGURES

Prior to February 18, 1987 operating revenues and expenditures were recorded by the Government of the Northwest Territories on behalf of the Institute. 1986 operating revenues and expenditures provided for comparative purposes have not been audited. 1986 revenue and expenditures for the Eastern Arctic Seaboard Monitoring Program, Rayrock Program and Northern Native Research Priorities Program have been audited. The 1986 balance sheet was audited. Certain of the 1986 financial statement amounts have been reclassified to conform with the presentation adopted in the current year.

3. DEFERRED REVENUE

Deferred revenue are monies received for programs for which the expenditures have not yet occurred.

	1987	1986
Rayrock Program - Indian and Northern Affairs Canada	$ 1,735	$4,659
Eastern Arctic Seaboard Monitoring Program - Canada Employment and Immigration Commission	13,471	-o-
Summer Field Program - Indian and Northern Affairs Canada and the Government of the Northwest Territories	37,500	-o-
Slowpoke Reactor Program - Energy, Mines and Resources Canada	7,000	-o-
	$59,706	$4,659

4. JURISDICTION OF INCORPORATION

The Science Institute of the Northwest Territories was established by an Act of the Government of the Northwest Territories in 1984.

Expenditures by Department
for the Year Ended March 31, 1987

Schedule 1

Management services (Note 1)	$180,538
Administration	28,459
Board of Governors	44,206
Chairman	17,078
Executive Director	12,268
Training	39,079
Research	17,544
Information	2,000
Conferences, workshops and symposiums	539
Eastern Arctic Seaboard Monitoring Program	57,061
Rayrock Program	2,924
	$401,696